

WHAT IS CLAIMED IS:

1 1. A wireless receiver for receiving data over a wireless channel, comprising:
2 a plurality of antennas having signal diversity such that what is received from the
3 wireless channel is not identical at each of the plurality of antennas;
4 digital signal processing logic for processing signals received by the plurality of
5 antennas, wherein the signals are one or more of Barker modulated signals and
6 complementary code keying (CCK) signals;
7 demodulation logic in the digital signal processing logic that demodulates signals from
8 two or more of the plurality of antennas, including one or more of a Barker
9 correlator and a CCK correlator corresponding to modulation of the signals; and
10 distortion compensation in the digital signal processing logic that processes at least a
11 portion of the signals received to compensate for channel distortion.

1 2. The wireless receiver of claim 1, wherein the demodulation logic comprises
2 a Barker demodulator comprising a Barker correlator and a Barker slicer.

1 3. The wireless receiver of claim 1, wherein the demodulation logic comprises
2 a CCK demodulator comprising a CCK correlator and a CCK slicer.

1 4. The wireless receiver of claim 1, further comprising a mean-square error
2 equalizer.

1 5. The wireless receiver of claim 1, further comprising a decision feedback
2 equalizer.

1 6. The wireless receiver of claim 1, further comprising:
2 a whitened-matched filter that receives one or more of the signals received by the
3 plurality of antennas and outputs a number of filtered signals, wherein the
4 whitened-matched filter operates on the one or more of the signals according to a
5 channel matched filter and a whitening filter.

1 7. The wireless receiver of claim 6, further comprising:
2 a feedback filter; and

3 a symbol-by-symbol minimum distance receiver (SbS MDR) that receives the number of
4 filtered signals from the sum of the whitened-matched filter and the feedback filter
5 and outputs a resulting data stream.

1 8. The wireless receiver of claim 7, wherein the SbS MDR comprises:
2 an SbS MDR matched filter, matched to a response of the whitened-matched filter and
3 the wireless channel;
4 a correlator; and
5 a slicer.

1 9. The wireless receiver of claim 8, comprising a combined filter
2 implementing the SbS MDR matched filter and the whitening filter.

1 10. The wireless receiver of claim 8, comprising a combined filter
2 implementing the SbS MDR matched filter and the feedback filter.

1 11. The wireless receiver of claim 8, with corrections prior to slicing.

1 12. The wireless receiver of claim 11, comprising a combined filter
2 implementing the SbS MDR matched filter and the whitening filter.

1 13. The wireless receiver of claim 11, comprising a combined filter
2 implementing the SbS MDR matched filter and the feedback filter.

1 14. A wireless receiver for receiving data over a wireless channel,
2 comprising:
3 a whitened-matched filter that receives one or more input signals received from the
4 wireless channel and outputs a number of filtered signals, wherein the
5 whitened-matched filter operates on the one or more input signals according to a
6 channel matched filter and a whitening filter; and
7 a symbol-by-symbol minimum distance receiver (SbS MDR) that receives the number of
8 filtered signals from the whitened-matched filter and outputs a resulting data stream.

1 15. The wireless receiver of claim 14, wherein the one or more input signals
2 is two or more input signals.

- 1 16. The wireless receiver of claim 14, wherein the one or more input signals
2 received is different than the number of filtered signals output.
- 1 17. The wireless receiver of claim 14, further comprising a Barker
2 demodulator.
- 1 18. The wireless receiver of claim 14, further comprising a complimentary
2 code keying demodulator.
- 1 19. The wireless receiver of claim 14, further comprising a decision feedback
2 equalizer.
- 1 20. The wireless receiver of claim 14, wherein the SbS MDR comprises:
2 an SbS MDR matched filter, matched to a response of the whitened-matched filter and
3 the wireless channel;
4 a correlator; and
5 a slicer.
- 1 21. The wireless receiver of claim 20, comprising a combined filter
2 implementing the SbS MDR matched filter and the whitening filter.
- 1 22. The wireless receiver of claim 20, comprising a combined filter
2 implementing the SbS MDR matched filter and a feedback filter.
- 1 23. The wireless receiver of claim 20, with corrections prior to slicing.
- 1 24. The wireless receiver of claim 23, comprising a combined filter
2 implementing the SbS MDR matched filter and the whitening filter.
- 1 25. The wireless receiver of claim 23, comprising a combined filter
2 implementing the SbS MDR matched filter and a feedback filter.
- 1 26. The wireless receiver of claim 14, wherein the channel matched filter is
2 implemented as a filter distinct from the SbS MDR matched filter and the whitening filter.
- 1 27. A wireless receiver for receiving data over a wireless channel,
2 comprising:
3 a channel matched filter;

4 a first combined filter coupled with an input to receive an output of the channel matched
5 filter, wherein the first combined filter operates according to an SbS MDR matched
6 filter and a whitening filter;
7 a correlator, coupled to receive an output of the first combined filter added to a feedback
8 signal;
9 a slicer, coupled to receive an output of the correlator added to one or more weights;
10 a second combined filter coupled to receive a slicer output, wherein the second combined
11 filter outputs the feedback signal and operates according to the SbS MDR matched
12 filter and a feedback filter; and
13 a data output for outputting a resulting data stream from an output of the slicer.

1 28. A wireless receiver for receiving data over a wireless channel,
2 comprising:
3 a plurality of antennas for receiving a plurality of signals from the wireless channel;
4 a symbol-by-symbol minimum distance receiver (SbS MDR);
5 a first combined filter having a transfer function that is a combination of a channel
6 matched filter and an SbS MDR matched filter, wherein the channel matched filter is
7 matched to a channel response of the wireless channel and the SbS MDR matched
8 filter is matched to the SbS MDR, the first combined filter coupled to provide one or
9 more filtered outputs to the SbS MDR; and
10 a second combined filter that combines a transfer function of the SbS MDR matched
11 filter with a feedback filter that receives an output of the SbS MDR and feeds back a
12 signal to be combined with the one or more filtered outputs at an input of the SbS
13 MDR.

1 29. The wireless receiver of claim 28, wherein the SbS MDR comprises:
2 a correlator;
3 means for weighting signals prior to slicing; and
4 a slicer that slices weighted signals from the correlator.

1 30. The wireless receiver of claim 28, wherein the first combined filter further
2 comprises a whitening filter transfer function.

1 31. A wireless receiver for receiving data over a wireless channel,
2 comprising:

3 one or more antennas for receiving one or more signals from the wireless channel;
4 a symbol-by-symbol minimum distance receiver (SbS MDR);
5 a first combined filter having a transfer function that is a combination of a channel
6 matched filter, a whitening filter and an SbS MDR matched filter, wherein the
7 channel matched filter is matched to a channel response of the wireless channel and
8 the SbS MDR matched filter is matched to the SbS MDR, the first combined filter
9 coupled to provide one or more filtered outputs to the SbS MDR; and
10 a second combined filter that combines a transfer function of the SbS MDR matched
11 filter with a feedback filter that receives an output of the SbS MDR and feeds back a
12 signal to be combined with the one or more filtered outputs at an input to the SbS of
13 MDR.

1 32. The wireless receiver of claim 31, wherein the SbS MDR comprises:
2 a correlator;
3 means for weighting signals prior to slicing; and
4 a slicer that slices weighted signals from the correlator.